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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,272	06/27/2003	Jeffrey E. Fink	BING-1-1011	8301

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EXAMINER

SELLMAN, CACHET I

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 10/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/608,272

Applicant(s)

FINK ET AL.

Examiner

Cachet I. Sellman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) 30-48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-29, drawn to a method, classified in class 427, subclass 558.
 - II. Claims 30 - 48, drawn to an apparatus, classified in class 118, subclass 1+.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process of changing the property of a plastic part can be practiced by a materially different apparatus such as one that exposes the entire object to electromagnetic radiation instead of controlling the radiation source to selectively expose the object.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Dale Barr on October 12, 2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-29. Affirmation of this election must be made by applicant in replying to this

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Office action. Claims 30 – 48 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Specification

6. The disclosure is objected to because of the following informalities: On page 8 lines 29 and 33 in the specification it states a "layer formed plastic part 320" but should read "a layer formed plastic part 355".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1,2,4,5 and 9-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Roberts (US 4156538).

Roberts teaches a method for making plastic book covers that are cross-linked to improve elasticity and stiffness. The covers are made with different layers of material that responds to cross-linking radiation (abstract). The method consists of providing an amount of radiation sufficient enough to improve the elasticity of the plastic sheet (column 3, lines 60-64) as required by **claims 1 and 2**. The radiation can be applied to selective areas of the plastic cover by using of a shield and moving the plastic on the table relative to the shield (column 3, lines 5-12, and 60-64) as required by **claims 4, 5 and 9**. High-energy electrons are used as the radiation source to crosslink the molecules resulting in improved elasticity and stiffness (column 3, lines 10-13) as required by **claims 10-12**.

9. Claims 1, 4,5,7,8 and 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith (US 3104321).

Smith discloses a process in which a plastic tubular member is exposed to electron beam radiation to improve its physical characteristics as required by **claim 1**. Smith teaches that it is well known that various materials, such as plastic coated wire, undergo changes when subjected to ionizing radiation (i.e. electron beam) column 1, lines 15-19). Smith further teaches that various polymers experience multiple cross-

linkage when subjected to ionizing radiation and as a result of the cross linkage the polymer exhibits different physical characteristics (column 1, lines 35-39) as required by **claims 11 and 12**. By irradiating the plastic coated wire with electron beams, the plastic exhibits a materially enhanced high temperature stability so the end product has extended utility, especially in the applications where it must with stand elevated temperatures (column 1, lines 39-45) as required by **claim 10**. Smith teaches that a continuous irradiation process is achieved by providing relative movement between the material to be irradiated and the electron beam (column 2, lines 63-68) as required by **claim 4**. The material can be passed through an irradiation zone where it moves through the plane of the electron beam (column 2, lines 3-7) as required by **claim 5**. The curved magnetic field configuration used in this method serves the purpose of focusing the electron beam into a single plane of irradiation, this is advantageous in the "precise" control of irradiation and in utilizing a maximum amount of energy from the electron beam for depositing in the material being irradiated (column 3, lines 28-37). Smith also disclosed the use of an energy selector for the irradiation process where an electron gun produces a beam composed of electrons and the magnetic field strength is varied to select the desired maximum irradiation energy (column 5, lines 3-9) as required by **claims 7 and 8**.

10. Claims 1-8 and 10-12, 15-17, 21-25 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Howell et al. (US 6107008).

Howell et al. discloses a process for post-curing an object formed using stereolithography. Stereolithography is a process for making a three dimensional plastic part on a layer-by-layer basis using an UV light or laser (column 1, lines 30-33). The post-curing process disclosed by Howell et al. consists of an electron beam source having predetermined beam output energy and placing the object in proximity to the source and causing the source to emit ionizing radiation which results in the object having a better "property profile" than which existed before post-curing (column 2, lines 26-38) as required by **claims 1-3 and 15-17**. In regards to claim 15, it should be noted that the examiner interpreted it as meaning the additional layer could be formed prior to exposing the layer to radiation. The electron beam source consists of an electron gun where electrons are electromagnetically guided and accelerated forming an electron beam through an accelerating section until they achieve a desired energy level. Bending magnets are used at the end of the accelerating section to apply a magnetic field to the beam to effect bending. Varying the magnetic field in a controlled manner causes the bending angle to change resulting in a scanning effect (column 3, lines 24-42 and Figure 1) as required by **claims 4, 6-8, 12, and 23-25**. Howell et al. further teaches that the object can be moved perpendicular to the beam by way of a conveyor (column 3, lines 42-45) as required by **claims 5, and 21-22**. The energy provided by the electron beam is enough to affect chemical changes such as cross-linking and alter the "property profile" of the object. The property profile includes mechanical properties (such as compressive strength), chemical resistance, and moisture resistance (column 4, lines 1-14) as required by **claims 10-11 and 28**.

11. Claims 15-24, 27 and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Hanna et al. (US 6574523 B1).

Hanna et al. teaches a process for forming plastic three-dimensional objects using a stereolithography method in which a UV curable liquid is exposed to a UV light source which produces a spot on the surface of the liquid that is movable across the surface by mirrors (column 4, lines 1-5 and 18-22) to solidify the liquid creating a plastic layer; once the layer is formed the platform is moved down so another layer can be formed (column 4, lines 53-59); and this process is repeated until the entire three-dimensional object is formed as required by **claims 17 and 21-24**. Hanna et al. teaches that parts with desired thermal resistance and durability in discrete regions of the part can be created by selectively controlling process parameters affecting mechanical properties during the build process (column 6, lines 36-40). Hanna et al. discloses a method of how a layer wise modification of properties can be achieved. A part can be produced that has a high temperature property only where required while the remainder of the part is built using a standard method by varying the UV exposure which assures a firm easy to handle part (column 7, lines 22-28 and Figure 2). In another example, Hanna et al. shows by changing the way the laser exposure is applied to the material can increase the durability of a part (Table II); one layer of the part is build using a laser power of 800mW and a spot size of 0.030 inches resulting in a tensile elongation of 4%

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and impact strength of 27 J/m; then a layer is formed using a laser power of 100mW and a laser spot size of 0.010 inches resulting in a tensile elongation of 10% and impact strength of 37 J/m (column 7, lines 23-65; column 10 lines 4-56; Figure 2 and 4) as required by **claims 15,16, 18- 20, 27 and 29**.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Howell et al. (US 6107008) as applied to claims 1-8 and 10-12, 15-17, 21-25 and 28 above, and further in view of Roberts (US 4156538).

Howell et al. teaches a process for curing plastic objects produced by stereolithography by exposing the object to an electron beam having predetermined beam output energy. Howell et al. teaches by exposing the object to electron beam radiation, its "property profile" (mechanical properties, chemical resistance, and moisture resistance) will improve as stated above for claims 1-8 and 10-12, 15-17, 21-25 and 28.

Howell et al. does not teach placing a shield between the layer formed part and the radiation source to control the exposure as required by **claim 26**.

Roberts teaches a process for making a plastic book cover in which the cover is exposed to electron beam radiation to crosslink the cover to improve its elasticity and stiffness. Only certain areas of the book covers are to be exposed to the electron beam radiation, in order to achieve this selective exposure a shield is used. The shield is placed between the radiation source and the object being irradiated and it allows for only certain parts of the object to be exposed to the radiation. It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process for curing a plastic part using electron irradiation taught by Howell et al. to include controlling the radiation source using the shield of Roberts to selectively irradiate certain parts of the object. One would have been motivated to do so because both Howell et al. and Roberts teach processes used for changing a property of a plastic part by using a controlled radiation source to treat a select area of a plastic part, therefore one would have a reasonable expectation of success in making a plastic object that has improved properties in select areas.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cachet I. Sellman whose telephone number is 571-272-0691. The examiner can normally be reached on Monday through Friday, 7:00 - 4:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Cachet Sellman
Patent Examiner
Art Unit 1762



TIMOTHY MEKS
SUPERVISORY PATENT EXAMINER